

What is claimed is:

1. A power supply apparatus comprising:

an input terminal;

5 an output terminal;

a charge pump DC/DC converter provided between the input terminal and the output terminal to convert an input voltage that is input in the input terminal into a given output voltage to be outputted toward the output terminal using charge and
10 discharge of a capacitor; and

a series regulator connected in parallel with the charge pump DC/DC converter between the input terminal and the output terminal to continuously control the input voltage so that the input voltage becomes the given output voltage to be outputted
15 toward the output terminal,

wherein the charge pump DC/DC converter and the series regulator are selectively operated depending on an operation command signal which is pre-generated based on change of a predicted or scheduled load, whereby the output voltage on an
20 operation side is taken out from the output terminal.

2. The power supply apparatus according to claim 1, wherein the DC/DC converter and series regulator are selectively operated using a load detection signal which is obtained from detecting
25 size of a load in addition to the operation command signal.

3. The power supply apparatus according to claim 1, wherein

the DC/DC converter is operated when the load is large and wherein the series regulator is operated when the load is small.

4. A power supply apparatus comprising:

5 an input terminal;

an output terminal;

a switching regulator provided between the input terminal and the output terminal to switch and convert an input voltage that is input in the input terminal into a given output voltage
10 to be outputted toward the output terminal; and

a series regulator connected in parallel with the switching regulator between the input terminal and the output terminal to continuously control the input voltage so that the input voltage becomes the given output voltage to be outputted toward
15 the output terminal,

wherein the switching regulator and the series regulator are selectively operated depending on an operation command signal which is pre-generated based on change of a predicted or scheduled load, whereby the output voltage on an operation side is taken
20 out from the output terminal.

5. The power supply apparatus according to claim 4, wherein the switching regulator and series regulator are selectively operated using a load detection signal which is provided by
25 detecting size of a load in addition to the operation command signal.

6. The power supply apparatus according to claim 4, wherein the switching regulator is operated when the load is large and wherein the series regulator is operated when the load is small.

5 7. A power supply apparatus comprising:

an input terminal;

an output terminal;

a charge pump DC/DC converter provided between the input terminal and the output terminal to convert an input voltage that is input in the input terminal into a given output voltage to be outputted toward the output terminal using charge and discharge of a capacitor; and

a series regulator connected in parallel with the charge pump DC/DC converter between the input terminal and the output terminal to continuously control the input voltage so that the input voltage becomes the predetermined output voltage to be outputted toward the output terminal,

wherein the series regulator is operated at all times and the DC/DC converter is operated depending on size of a load.

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8. The power supply apparatus according to claim 7, wherein the operation of the DC/DC converter is controlled using an operation control signal which is pre-generated based on predicted or scheduled change of a load.

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9. The power supply apparatus according to claim 8, wherein the operation of the DC/DC converter is controlled using a load

detection signal which is obtained from detecting size of a load in addition to the operation control signal.

10. A power supply apparatus comprising:

5 an input terminal;

an output terminal;

a switching regulator provided between the input terminal and the output terminal to switch and convert an input voltage that is input in the input terminal into a given output voltage

10 to be outputted toward the output terminal; and

a series regulator connected in parallel with the switching regulator between the input terminal and the output terminal to continuously control the input voltage so that the input voltage becomes the given output voltage to be outputted toward

15 the output terminal,

wherein the series regulator is operated at all times and the switching regulator is operated depending on size of a load.

11. The power supply apparatus according to claim 10, wherein
20 the operation of the switching regulator is controlled using an operation control signal which is pre-generated based on predicted or scheduled change of a load.

12. The power supply apparatus according to claim 11, wherein
25 the operation of the switching regulator is controlled using a load detection signal which is obtained from detecting size of a load in addition to the operation control signal.